

REDISCOVERY OF *DAPHNOPSIS HELLERIANA*

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AMOS ARTHUR HELLER (1867–1944) first discovered and collected plants of the Puerto Rican species *Daphnopsis helleriana* Urban. Several biographical sketches of Heller are to be found but they emphasize his botanical contributions to the study of plants of the United States. In 1898, "Through the kind liberality of Mr. Cornelius Vanderbilt, Mr. and Mrs. A. A. Heller have been sent to the island of Porto Rico to collect specimens illustrating the flora and natural vegetable resources of the new colony."¹ They returned to New York in June of 1899 ". . . with nearly 8,000 specimens, and copious notes referring to them."² This collecting excursion sometimes is mentioned in the biographical sketches but is not important in terms of the present note.

In 1900, however, Heller ". . . returned to Puerto Rico to extend his collections made in 1899. He will keep the field during January and February, with headquarters at Mayaguez in the western part of the island."³ This trip may have been financed personally by Heller for the published herbarium accession record of the Garden shows "450 herbarium specimens given by Mr. A. A. Heller."⁴ If financed by the Garden, or special funds through the Garden, the specimens would not have been accessioned under the gift category. Further, the following notice appeared in *Muhlenbergia* (1: fly leaf following page 30. August 9, 1900): "Several sets of my Porto Rican collection of 1900 may still be had at the rate of 10 cents per specimen, carriage prepaid. They contain about 100 species of flowering plants, among which are a number of species confined exclusively to Porto Rico, and one new species, *Daphnopsis Helleriana* Urban." In the same issue of *Muhlenbergia* (1: 10–17) an article by F. S. Earle included identifications of Heller's collection of fungi from this trip. The numbers and dates show that Heller did not restrict his collecting to the western part of the island but collected also in the vicinity of Santurce and Bayamon. It was while collecting on the "calcareous hills near Bayamon" on February 23 that he found (no. 4689) *D. helleriana*. Thereafter, this plant was not recollected for nearly sixty years.

The lack of subsequent collections was particularly frustrating to Nevling in the preparation of a taxonomic revision of *Daphnopsis*. Al-

¹ N. L. Britton. Report of the Secretary and Director-in-Chief. Bull. N. Y. Bot. Gard. 1: 182. 1899.

² N. L. Britton. Report of the Secretary and Director-in-Chief. Bull. N. Y. Bot. Gard. 1: 309. 1900.

³ Anon. News, Notes and Comments. Jour. N. Y. Bot. Gard. 1: 16. 1900.

⁴ Anon. Accession. Jour. N. Y. Bot. Gard. 1: 108. July, 1900.

though Heller's "type collection" had received relatively wide distribution it consisted of immature staminate specimens exclusively. An attempt to recollect the species, in January of 1963, by Nevling and Richard A. Howard was not successful.⁵ Many of the limestone hills were (and are) in the process of being leveled to provide raw materials for the building industry. It was feared that the locality might have been destroyed.

Howard discussed the *Daphnopsis helleriana* mystery later in the same year with Woodbury who told of rediscovering it in 1958 during the course of a detailed examination of the flora of the chain of mogotes which parallel the north coast of Puerto Rico. The mogotes, in this instance, are low, steeply eroded, calcareous hills. The populations of *D. helleriana* are to be found at their summits except for the population at kilometer 21.2 which is found on the first ledge below the summit.

In the fall of 1963 Woodbury supplied a few seedlings for transport to Cambridge. Through an unfortunate accident these plants were lost. A second attempt, in 1964, was successful. Thymelaeaceous plants are, in general, difficult to propagate or transplant and it was necessary to keep the seedlings under mist propagation and polyethylene where they remain nearly two years later. Nevling was able to see living plants in the field in April of 1965, thanks to Woodbury's guidance.

Although this species has many of the typical thymelaeaceous features such as low stature, flexible branches, and a well-developed unligified fiber structure within the bark, one feature was lacking. Missing was the nearly typical odor of stems or crushed leaves. This fragrance, from coumarin derivative compounds, or lack of it, may prove to be indicative of the presence or absence of certain compounds and may eventually serve as an accessory character of taxonomic value.

The scientific description published by Nevling (Ann. Missouri Bot. Gard. 46: 287-289. 1959) has been recast to include additional information derived from more recent collections and from field observations.

Daphnopsis helleriana Urb. Symb. Antill. 2: 453. Oct. 1901. [Type: *Heller 4689* (♂) !]

Dioecious shrubs or small trees to 4.5 m. tall, dichotomously branching, the bark thick, fibrous, the wood white, soft, the young branches with few leaves, flexible, golden-tomentose and glabrescent; tap root long. Leaves simple, alternate, the blade elliptic, oblong, or obovate, 3-16 cm. long, 2-7 cm. broad, mucronulate to obtuse at the apex, cuneate at the base, thin-coriaceous, glabrous, golden-tomentose to villous but soon glabrescent beneath; both surfaces light green but on drying the upper sometimes becoming reddish-brown, the lower glaucescent, developing reddish-brown pigment bordering the veinlets, the costa plane above, elevated beneath, primary lateral veins prominulous above, prominent beneath, somewhat

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arcuate-ascending and extremely reticulate; petiole 2–6 mm. long, scarcely canaliculate. Inflorescences borne terminally on the very young stems, umbelliform, 3–5-flowered, golden-tomentose to villous throughout, the primary peduncle 5–10 mm. long, nodding, the rachis ca. 1 mm. long, secondary peduncles 1–3 mm. long. Staminate flowers: pedicel to 1 mm. long; calyx tube tubular, 5–11 mm. long, 2–3 mm. in diameter at the orifice, golden-tomentose without, glabrous and somewhat red-pigmented within; calyx lobes unequal, greenish white and indefinitely papillate within, the outer 2–3 mm. long, ca. 2.5 mm. broad, the inner 1.5 mm. long and broad, spreading; petals 4, squamelliform, as long as broad, inserted at the orifice, minute; antisepalous stamens inserted below the orifice, at most subexserted, the alternisepalous inserted about two anthers' lengths below the orifice, included, the anthers oblong, 1.25–1.5 mm. long, 0.25–0.5 mm. broad, sessile, the pollen yellow; disc of a few irregular lobes nearly as tall as the pistillode, free, glabrous; pistillode fusiform, ca. 11 mm. long, glabrous. Pistillate flowers: pedicel to 1 mm. long; calyx tube subcampanulate to urceolate, ca. 5 mm. long, ca. 2–3 mm. in diameter at the orifice, golden-tomentose without, glabrous within; calyx lobes unequal, spreading, indefinitely papillate and pale green within, ca. 2–3 mm. long and broad; petals 4, papilliform, inserted at the orifice, minute; staminodia 8 or sometimes absent, in two whorls below the orifice, minute, with brownish pigmentation; disc minute or absent (?); pistil conical, tapering to the stigma, ca. 5 mm. long, 1.5 mm. in diameter, glabrous, the stigma capitate, papillate, exserted. Fruit a white berry (pseudodrupe), elliptic-ovoid, 10–15 mm. long, 8–10 mm. in diameter.

Flowering irregularly from February through April. Found near the summit and at the summit of calcareous hills at an altitude of 75–300 feet.

Puerto Rico: San Juan, near Bayamon, *Heller 4689* (A, E, GH, L, MICH, NY, US); w. of Bayamon, Route 2, kilometer 23.7, *Woodbury 6711* (A, ARP⁶); w. of Bayamon, Route 2, kilometer 21.2, *Woodbury 6716* (A, ARP), *Howard, Nevling & Woodbury 15686* (A—chromosome voucher), seedlings under cultivation, *Nevling 118* (AAH); s. of Dorado, Higuillar Bro. *Alain Liogier 10680* (GH, NY); Guajataca Gorge, Quebradillas, *Woodbury 3196* (A, ARP).

The holotype of this species was destroyed in Berlin during World War II. Because of its relative completeness I am choosing the specimen of *Heller 4689* deposited in the Gray Herbarium as the lectotype.

Knowledge of the cytology and genetics of the Thymelaeaceae is limited severely except in isolated cases. Chromosome numbers have been reported for only a few genera and they, unfortunately, are all members of the same subfamily. Apomixis has been demonstrated in *Wikstroemia* and a polyploid series is known in *Pimelea*. The latter situation is of more than passing interest as all of the species of *Pimelea*, which have been examined in detail, have been found to be gynodioecious. All of the species of *Daphnopsis*, which are known in sufficient detail, are dioecious.

⁶ Agricultural Experiment Station, University of Puerto Rico, Rio Piedras.

To date, chromosome numbers of only two species have been reported: *D. americana* (Mill.) Johnst. ($n = 9$) and *D. philippiana* Krug & Urb. ($n = 9$). It was, therefore, somewhat of a surprise to find *D. helleriana* with a haploid number of 18. This count is based on observations of meiotic tissue, metaphase I through anaphase II, in developing pollen (Voucher: Howard, Nevling & Woodbury 15785). No configuration except bivalent formation was observed and all divisions appeared normal and orderly. Mature pollen is abnormal in that there are many collapsed grains and some size variation. Pollen stainability, with cotton blue in lactophenol, is not high but we are not reporting a percentage because of the small sample size. Fruit is set relatively frequently and seedlings are seen in nature. There appear to be no special modifications for vegetative reproduction and it is believed that the species reproduces solely by fruit. There is no evidence to support or reject apomixis in this case although the small size of the total population might be regarded as negative evidence. At present we do not wish to postulate the nature of this tetraploid species. Whether an allotetraploid or autotetraploid, it is of interest because it has arisen in a dioecious group.

ARNOLD ARBORETUM AND GRAY HERBARIUM

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